**Introduction** Today you have learned about chemical bonding. You will use your knowledge of the atom, bonding, and the octet rule to build compounds and describe the bonding.

**Materials**

* Blank Index cards
* Label dots – small red and yellow
* Markers

**Methods**

In groups of 4 you will build Lewis Dot structures for several elements. By combing those elements into compounds you will explore bonding.

**Instructions and Discussion Questions**

**Part I - Instructions:** Using a marker, write the Atomic Symbol of neon on the center of an index card. Determine the number of valence electrons (electrons in the outer shell of Ne) and put that number of label dots around the atomic symbol on the index card in the form of a Lewis dot structure. Now make one for argon.

**Part I - Disucssion Questions**

1. What group/family of the periodic table are neon and argon in?
2. Write down observations about the Lewis Dot structures you just made. (# of electrons, same/different, electrons paired or single)
3. Why do you think neon and argon are called **noble** gases? What does noble mean, and what about their structures makes them noble?
4. The Octet Rule requires that atoms in bonded species tend to have noble-gas structures. Define octet rule in your own words.

**Part II -** Build Lewis Dot structures for lithium, beryllium, sodium, magnesium, oxygen, fluorine, sulfur and chlorine.

1. How many compounds (**combinations of 2 different atoms**) can you make that satisfy the octet rule? List the compounds here and draw the dot structures.
2. What do you notice about the bonding of your compounds? Write your observations here.

**Part III:** Build Lewis Dot structures for carbon, and nitrogen using red dots. Build Lewis Dot structures for hydrogen using yellow dots. You may build as many hydrogen atoms as you need to answer the following questions.

1. How many compounds (**combinations of 2 different atoms**) can you make? List the compounds here and draw the dot structures.
2. What do you notice about the bonding of these compounds? Write your observations here.

**Part IV:** Build two chlorine Lewis Dot structures, one with red dots, one with yellow. How could these two chlorine atoms bond (describe)? Write your observations here.

**Part V:** Build the Lewis Dot structures for sodium chloride (NaCl) and use your Lewis Dot structure for dichlorine gas (Cl2) from Part IV.

1. What do you notice about the two different bonds? Write your observations here.
2. Which compound do you think shares electrons?
3. Which element do you think could exchange electrons to form a bond?

**Part VI:** Fill out the following chart based on your inquiry observations

|  |  |  |
| --- | --- | --- |
|  | **Definition** | Picture |
| Ionic Bonding |  |  |
| Covalent Bonding |  |  |